

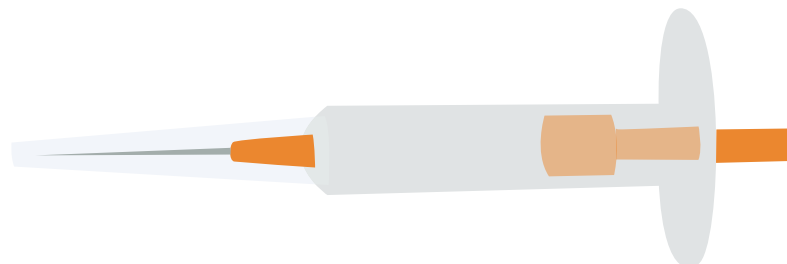
# A Vet Student's Guide to Common Chemotherapy Drugs



| Drugs                   | Indications   | Mechanism  | Administration   | Side Effects   | Monitoring  | Additional Notes   |
|-------------------------|---|--|--|--|---|--|
| <b>Carboplatin</b>      | <p>Carcinomas (especially anal sac adenocarcinoma, squamous cell carcinoma, pulmonary carcinoma, nasal carcinoma)</p> <p>Sarcomas (especially osteosarcoma, injection-site sarcoma)</p> | Inhibits DNA replication, RNA transcription, and protein synthesis                         | <p>IV administration</p> <p>Typical dosing regimen is q3wks in dogs, q4wks in cats. (Older cats may require a longer interval due to decreased kidney function)</p>  | <p>Myelosuppression</p> <p>Possible GI effects (especially in small dogs receiving high doses)</p>   | <p>Check CBC weekly after the first dose to determine neutrophil/platelet nadirs and ensure dose is appropriate</p> <p>Double nadir is often observed (first at 10-14 days, then again at 19-21 days)</p> | <p>2nd generation platinum drug: less nephrotoxicity and ototoxicity than cisplatin, but more pronounced myelosuppression</p> <p>Reduce dose in presence of azotemia (drug is cleared by the kidneys)</p>        |
| <b>Cisplatin</b>        | <p><b>DO NOT USE IN CATS!</b></p> <p>Carcinomas (squamous cell, transitional cell, ovarian, nasal, and thyroid)</p> <p>Osteosarcoma</p>   | Inhibits DNA replication, RNA transcription, and protein synthesis                         | <p>IV administration</p> <p>Local treatment (drug-impregnated beads, intralesional injection)</p>  | <p>Myelosuppression</p> <p>Nephrotoxicity (need extensive fluid diuresis with administration)</p> <p>Vomiting</p> <p>Fatal pulmonary edema in cats</p> | <p>Assess CBC and renal values before treatment, then monitor throughout treatment</p>  | <p>Administer anti-nausea meds prior to treatment</p> <p>Do not use if renal values elevated</p> <p>Used less often than carboplatin</p>   |
| <b>Chlorambucil</b>     | <p>Chronic lymphoid leukemia in dogs</p> <p>Low-grade lymphoma (especially GI lymphoma) in cats</p>   | <p>Alkylating agent</p> <p>Cross-links with cellular DNA, interfering with replication</p> | <p>Oral administration</p> <p>May be administered at low doses daily or every other day, or at high doses q3-4wks (pulse therapy)</p>                                | <p>Myelosuppression, especially thrombocytopenia</p> <p>Seizures in cats receiving high-dose pulse therapy</p> <p>Liver toxicity (rare)</p>            | <p>Check CBC q2wks initially, then q8-12wks on pets receiving long-term treatment.</p>  | <p>Administer anti-nausea meds prior to treatment</p> <p>Do not use if renal values elevated</p> <p>Used less often than carboplatin</p>   |
| <b>Cyclophosphamide</b> | Lymphoma (dogs & cats)  | <p>Alkylating agent</p> <p>Cross-links with cellular DNA, interfering with replication</p> | <p>Oral or IV administration</p> <p>IV dosing is more common, due to improved predictability and bioavailability</p> <p>Oral may be used for low-dose metronomic</p> | <p>Myelosuppression, especially neutropenia</p> <p>Hemorrhagic cystitis</p> <p>GI upset</p>  | <p>Check CBC 7 days after the first dose and 7 days after any change in dosing</p>  | <p>Administered as a prodrug that requires hepatic activation; may be less effective in pets with decreased liver function</p> <p>Concurrent furosemide administration may help prevent hemorrhagic cystitis</p> |

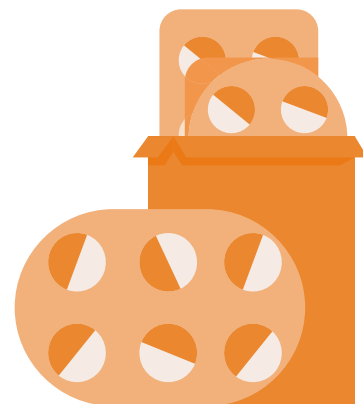


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| <b>Doxorubicin</b>      | Lymphoma (dogs)<br><br>Sarcomas (especially osteosarcoma, hemangiosarcoma, soft tissue sarcomas)<br><br>Carcinoma (especially mammary carcinoma) | Antibiotic<br><br>Inhibits DNA synthesis, RNA synthesis, and protein synthesis   | IV administration<br><br>Infuse slowly: rapid administration may cause anaphylaxis<br><br>Restrain carefully and monitor throughout administration to minimize extravasation risk | Severe vesicant effects with extravasation<br><br>Myelosuppression, especially neutropenia<br><br>GI effects (vomiting, colitis)<br><br>Cardiac toxicity (cumulative over lifespan)<br><br>Nephrotoxicity in cats | Check CBC 7 days after the first dose and 7 days after any change in dosing<br><br>Monitor kidney values in cats   | Avoid in cats with pre-existing renal disease<br><br>Use with caution in any pet with evidence of hepatic disease<br><br>Any degree of extravasation, no matter how small, requires treatment with dexrazoxane |
| <b>L-asparaginase</b>   | Lymphoma (very effective in dogs, less effective in cats)  | Breaks down asparagine, taking advantage of the fact that normal cells produce their own asparagine, but cancer cells cannot | SC or IM administration   | Anaphylaxis (signs may include vomiting and urticaria)<br><br>Myelosuppressive (when given in conjunction with vincristine)<br><br>Pancreatitis (rare)  |  | Premedication with antihistamine may decrease reaction risk<br><br>Does not cross the blood-brain barrier, but can be used to treat CNS neoplasia (depletes asparagine throughout the entire body)             |
| <b>Lomustine (CCNU)</b> | Lymphoma (dogs and cats)<br><br>Mast cell tumors<br><br>Histiocytic sarcoma<br><br>Brain tumors  | Alkylating agent<br><br>Inhibits DNA/RNA synthesis   | Oral administration   | Neutropenia (usually 5-7 days post-treatment in dogs, timing variable in cats)<br><br>Hepatotoxicity in dogs<br><br>Pulmonary fibrosis in cats (rare)<br><br>Nephrotoxicity (rare)                                | Check CBC at 7 days in dogs; check weekly in cats until nadir is detected (may be as late as 5 weeks)<br><br>Check ALT before each dose; any elevation warrants a further workup | Crosses the blood-brain barrier; useful in the treatment of CNS neoplasia  |



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| <b>Mitoxantrone</b> | Lymphoma (dogs)<br><br>Carcinomas (especially transitional cell carcinoma, anal sac adenocarcinoma) | Antibiotic<br><br>Inhibits DNA/RNA synthesis                     | IV administration | Myelosuppression, especially neutropenia<br><br>Colitis<br><br>Vesicant effects with extravasation (less severe than doxorubicin)  | Check CBC 7 days after dosing and 7 days after any dose change | Consider prophylactic metronidazole and high-fiber diet to reduce colitis risk          |
| <b>Vinblastine</b>  | Mast cell tumors (dogs)<br><br>Lymphoma (cats and dogs)<br><br>Transitional cell carcinoma          | Antitubulin agent<br><br>Prevents cell division during metaphase | IV administration | Myelosuppression, especially neutropenia<br><br>GI effects<br><br>Vesicant effects with extravasation (less severe than doxorubicin)   | Check CBC 7 days after dosing and 7 days after any dose change |   |
| <b>Vincristine</b>  | Lymphoma (cats and dogs)<br><br>Transitional cell carcinoma<br><br>Transmissible venereal tumor     | Antitubulin agent<br><br>Prevents cell division during metaphase | IV administration | Myelosuppression, especially neutropenia<br><br>Anorexia (likely secondary to ileus, more common in cats than dogs)<br><br>Peripheral neurotoxicity in humans (not observed in pets) | Check CBC; neutrophil nadir typically occurs on day 4          | May increase platelet count in some pets; may have applications in the treatment of ITP |

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### About the Author

Cathy Barnette is a practicing small animal veterinarian, freelance writer, and contributor to VetPrep and VetTechPrep. She is passionate about both veterinary medicine and education, working to provide helpful information to veterinary teams and the general public. In her free time, she enjoys spending time in nature with her family and leading a Girl Scout troop.